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(71) Applicant: **International Business Machines Corporation**
Armonk, N.Y. 10504 (US)

(72) Inventors:
- **Arimilli, Ravi Kumar**
  Austin, Texas 78759 (US)
- **Dodson, John Steven**
  Pflugerville, Texas 78660 (US)
- **Lewis, Jerry Don**
  Round Rock, Texas 78681 (US)

(74) Representative: **Burt, Roger James, Dr. et al**
IBM United Kingdom Limited
Intellectual Property Department
Hursley Park
Winchester Hampshire SO21 2JN (GB)

(54) Cache coherency protocol with tagged state and historical information

(57) A cache coherency protocol uses a "Tagged" coherency state to track responsibility for writing a modified value back to system memory, allowing intervention of the value without immediately writing it back to system memory, thus increasing memory bandwidth. The Tagged state can migrate across the caches (horizontally) when assigned to a cache line that has most recently loaded the modified value. Historical states relating to the Tagged state may further be used. The invention may also be applied to a multi-processor computer system having clustered processing units, such that the Tagged state can be applied to one of the cache lines in each group of caches that support separate processing unit clusters. Priorities are assigned to different cache states, including the Tagged state, for responding to a request to access a corresponding memory block. Any tagged intervention response can be forwarded only to selected caches that could be affected by the intervention response, using cross-bars. The Tagged protocol can be combined with existing and new cache coherency protocols. The invention further contemplates independent optimization of cache operations using the Tagged state.

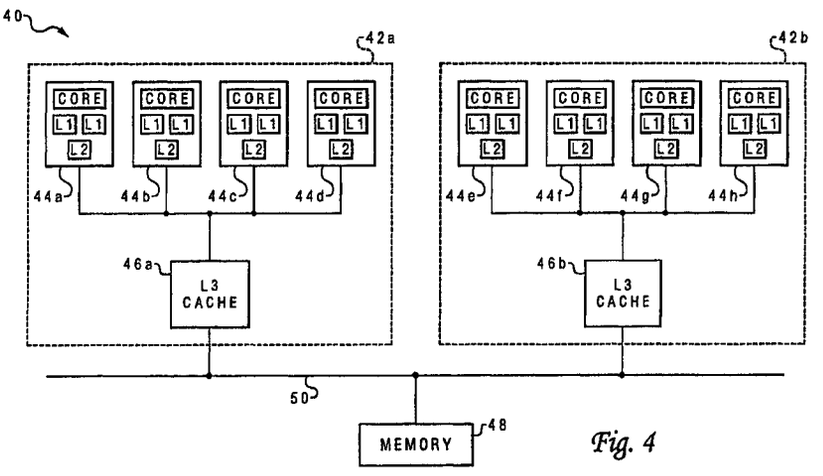

Fig. 4

EP 0 936 553 A3

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EUROPEAN SEARCH REPORT

Application Number
EP 99 30 1052

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	BORRILL P: "FUTUREBUS PROTOCOLS KEEP CACHE DATA CONSISTENT" COMPUTER TECHNOLOGY REVIEW, vol. 9, no. 10, 21 June 1989 (1989-06-21), page 36, 38 XP000054499 ISSN: 0278-9647 * the whole document *	1-7,9,10	G06F12/08
X	SWEAZY P ET AL: "A CLASS OF COMPATIBLE CACHE CONSISTENCY PROTOCOLS AND THEIR SUPPORT BY THE IEEE FUTUREBUS" , PROCEEDINGS OF THE ANNUAL INTERNATIONAL SYMPOSIUM ON COMPUTER ARCHITECTURE, TOKYO, JUNE 2 - 5, 1986, NR. SYMP. 13, PAGE(S) 414 - 423 , INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS XP002039991 * page 33, middle column, line 9 - page 34, right-hand column, line 2; figures 2,3 *	1-7,9,10	
X	"CACHING ON FUTUREBUS" ELECTRONIC ENGINEERING, vol. 60, no. 739, 1 July 1988 (1988-07-01), page 31, 33/34, 36 XP000046105 ISSN: 0013-4902 * page 416, left-hand column, paragraph 3 - page 420, left-hand column, paragraph 4.2; figure 3 *	1-7,9,10	TECHNICAL FIELDS SEARCHED (Int.Cl.6) G06F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	3 August 1999	Ledrut, P

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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